CLAIMS

1. A process for the recovery of a catalyst in a reaction using boron trifluoride or its complex as the catalyst, wherein the process is characterized in that a reaction product and a reaction solvent are separated after completion of the reaction by using a solvent containing a hydrofluorocarbon compound and/or an oxygenic hydrofluorocarbon compound as the reaction solvent.

2. The process for the recovery according to Claim 1, wherein the reaction solvent is a solvent containing a hydrofluorocarbon compound and/or an oxygenic hydrofluorocarbon compound with no ozone-depleting potential.

3. The process for the recovery according to Claim 1, wherein the reaction solvent is a solvent containing a hydrofluorocarbon compound having an ether linkage.

4. The process for the recovery according to Claim 1, wherein the reaction solvent is a mixed solvent further containing a fluorine compound with the specific gravity of 1.1 or more.

5. The process for the recovery according to Claim 1, wherein the hydrofluorocarbon compound is a compound expressed by a composition formula $C_nH_mF_{2n-m+2}$ (n = 3 to 12, and m = 1 to 2n), or a cyclic perfluorocarbon compound with the number of carbon atoms of 12 or less in which fluorine atoms are partially substituted by hydrogen atoms.

6. The process for the recovery according to Claim 1, wherein the oxygenic hydrofluorocarbon compound is a compound expressed by a composition formula $C_nH_mF_{2n-m+2}O$ (n = 3 to 12, and m = 1 to 2n), or an oxygenic cyclic perfluorocarbon compound with the number of carbon atoms of 12 or less in which fluorine atoms are partially substituted by hydrogen atoms.

7. The process for the recovery according to Claim 1, wherein a complexing agent that forms a complex with boron trifluoride in the boron trifluoride complex is a polar compound.

8. The process for the recovery according to Claim 7, wherein the complexing agent is selected from a group consisting of water, alcohols, ethers, phenols, amines, ketones, aldehydes, esters, acid anhydrides, and acids.

9. The process for the recovery according to Claim 1, wherein the boron trifluoride complex is a boron trifluoride-ether complex.

10. The process for the recovery according to Claim 1, wherein the reaction using boron trifluoride or its complex as a catalyst is dimerization reaction, oligomerization reaction, condensation reaction, or polymerization reaction of olefin.

11. A process for recycling of a catalyst characterized by reusing the catalyst recovered by the process according to any Claims 1 to 10 for the reaction.

12. A process for the recovery of a catalyst in a reaction using boron trifluoride or its complex as a catalyst, wherein the process is characterized by extracting boron trifluoride or its complex from a reaction product after completion of the reaction, wherein a hydrofluorocarbon compound and/or an oxygenic hydrofluorocarbon compound is used as an extracting solvent.

13. The process for the recovery according to Claim 12, wherein, after boron trifluoride or its complex is extracted from the reaction product, the extract is separated into an extracting solvent and boron trifluoride or its complex by distillation.

14. The process for the recovery according to Claim 12, wherein the extracting solvent is

a solvent containing a hydrofluorocarbon compound and/or an oxygenic hydrofluorocarbon compound with no ozone-depleting potential.

15. The process for the recovery according to Claim 12, wherein the extracting solvent is a mixed solvent further containing a fluorine compound with the specific gravity of 1.1 or more.

16. The process for the recovery according to Claim 12, wherein the hydrofluorocarbon compound is a compound expressed by a composition formula $C_nH_mF_{2n-m+2}$ (n = 3 to 12, and m = 1 to 2n), or a cyclic perfluorocarbon compound with the number of carbon atoms of 12 or less in which fluorine atoms are partially substituted by hydrogen atoms.

17. The process for the recovery according to Claim 12, wherein the oxygenic hydrofluorocarbon compound is a compound expressed by a composition formula $C_nH_mF_{2n-m+2}O$ (n = 3 to 12, and m = 1 to 2n), or an oxygenic cyclic perfluorocarbon compound with the number of carbon atoms of 12 or less in which fluorine atoms are partially substituted by hydrogen atoms.

18. The process for the recovery according to Claim 12, wherein the extracting solvent is a solvent containing a hydrofluorocarbon compound having an ether linkage.

19. The process for the recovery according to Claim 12, wherein the complexing agent that forms a complex with boron trifluoride in the boron trifluoride complex is a polar compound.

20. The process for the recovery according to Claim 19, wherein the complexing agent is selected from a group consisting of water, alcohols, ethers, phenols, amines, ketones, aldehydes, esters, acid anhydrides, and acids.

21. The process for the recovery according to Claim 12, wherein the boron trifluoride complex is a boron trifluoride-ether complex.

22. The process for the recovery according to Claim 12, wherein the reaction using boron trifluoride or its complex as a catalyst is dimerization reaction, oligomerization reaction, condensation reaction, or polymerization reaction of olefin.

23. A process for recycling of the catalyst characterized by reusing the catalyst recovered by the process according to any Claims 12 to 19 for the reaction.